

Citation for published version:

De Clercq, D, Thongpapanl, N & Dimov, D 2011, 'The moderating role of organizational context on the relationship between innovation and firm performance', *IEEE Transactions on Engineering Management*, vol. 58, no. 3, pp. 431-444. <https://doi.org/10.1109/TEM.2010.2048911>

DOI:

[10.1109/TEM.2010.2048911](https://doi.org/10.1109/TEM.2010.2048911)

Publication date:

2011

Document Version

Peer reviewed version

[Link to publication](#)

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**THE MODERATING ROLE OF ORGANIZATIONAL CONTEXT ON THE
RELATIONSHIP BETWEEN INNOVATION AND FIRM PERFORMANCE**

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Paper accepted for publication in *IEEE Transactions on Engineering Management*

March 7, 2010

THE MODERATING ROLE OF ORGANIZATIONAL CONTEXT ON THE RELATIONSHIP BETWEEN INNOVATION AND FIRM PERFORMANCE

ABSTRACT

This study examines how two cross-functional conditions (decision autonomy and trust) and a key managerial attitude toward the organization (organizational commitment), both individually and collectively, act as catalysts of the firm's ability to convert its innovation pursuits into performance outcomes. An analysis of the performance of 232 firms offers support for the hypothesized interaction effects. The positive relationship between innovation and firm performance is stronger for higher levels of decision autonomy, trust, and organizational commitment. In addition, consistent with a systems approach to organizational contingencies, the contribution of innovation to firm performance is stronger when the firm's context comes closer to an "ideal" configuration of these three factors. The authors discuss the study's implications, limitations, and directions for further research.

Keywords: innovation, firm performance, contingencies, decision autonomy, trust, organizational commitment

I. INTRODUCTION

In changing and increasingly competitive environments, firms must constantly seek out novel solutions to organizational or market problems [1], [2] and translate them into improved performance outputs [3]. To this end, innovation—defined herein as the extent to which a firm pursues the development of new products and services or exploits new market opportunities [4], [5]—takes on instrumental importance. Such pursuits can offer important benefits to the organization, such as the accommodation of external market and technological uncertainties [6] and the enhancement of its adaptive capabilities [3], [7]. With a few exceptions [8], [9], prior studies have largely demonstrated a positive relationship between innovation and firm performance [2], [10], [11], [12].

But equally appealing arguments hold that the effective implementation of firms' innovation pursuits does not occur automatically or universally [13]. In this regard, several

studies reveal the moderating roles of *external* factors, such as the development of strategic alliances [2], investments in customer capital [14], degrees of internationalization [9], and environmental turbulence [2]. Yet for innovation to result in performance improvements, it also needs to be managed properly and successfully *within* the organization. Many innovative pursuits are incremental in nature, aimed at improvements to the “nuts and bolts” of the organization’s product or service offerings [5], [15], and they encompass various activities spread across different organizational departments [16]. Their effect on organizational performance therefore reflects the balance between the market impact of new products and services and the costs associated with managing the innovation process within the organization.

Innovation processes can encounter various internal barriers. Managers may believe that sharing their ideas with peers in other departments will reduce the resources allocated to their own departments during the implementation of innovative solutions [17], which would make them reluctant to invest, or even resistant to, cross-functional relationships. Furthermore, innovative projects can lead to less successful outcomes at the firm level, to the extent that they are marked by goal conflicts and destructive power games [18]. Significantly, the successful implementation of firms’ innovation pursuits depends on the effective combination of knowledge across departments [19], [20]. Managers must collaborate and share knowledge to ensure that the commercialization of new products meets both technological and market requirements [20], [21]. Thus, to reap the benefits from their innovation pursuits, firms must be able to combine and integrate function-specific knowledge—an ability that depends on various organizational context features, particularly the interactions between and attitudes of managers in different functional departments [22]. This scenario poses a question that serves as the main motivation for this

article: How does the relationship between innovation and firm performance vary across different organizational contexts?

In addressing this question, we build on prior studies that emphasize that the successful introduction of new products and services in the marketplace depends on cross-functional coordination mechanisms [23], relationship building [24], and the organizational commitment of the persons involved [25]. Therefore, we focus on three facets of firms' internal contexts: decision autonomy, trust, and organizational commitment. The first two factors represent key structural and relational aspects of cross-functional collaboration [26], [27], whereas the third represents a key managerial attitude, namely, managers' commitment to their organization and its goals [25]. The glue that holds these three factors together is not only their individual and collective facilitation of intra-organizational knowledge flows but also their ability to serve as substitutes for more restrictive governance mechanisms that emphasize formal controls or sanctioning. Specifically, open and benevolent intra-organizational cooperation should be prompted by internal contexts in which managers have a voice in the decisions that affect them, trust that colleagues will not act in opportunistic ways during interactions, and are willing to exhibit strong voluntary efforts on behalf of their organization [22].

We develop two parallel arguments regarding how these three contextual factors may influence the instrumentality of innovation for firm performance. First, the combination of dispersed, complementary knowledge plays a critical role in the translation of innovation into performance outcomes [20], and such knowledge combination in turn depends on the extent to which the organizational context facilitates the unlocking of relevant knowledge from its holders [28]. Indeed, knowledge-based theory suggests that "although ideas are formed in the minds of individuals, the interaction between individuals typically plays a critical role in developing these

ideas” [29, p. 15], and appropriate intra-organizational arrangements are needed to facilitate this interaction and leverage knowledge toward positive outcomes [22], [30]. Specifically, we argue that individually, decision autonomy, trust, and organizational commitment facilitate firms’ ability to turn their innovation pursuits into performance, because they each enhance the quality of knowledge exchanges across functional departments [19]. Second, from a systems perspective [31], these factors constitute a collective *configuration* that offers a holistic representation of the firms’ organizational context [32]. Thus, to the extent that an “ideal” configuration of contextual factors provides a platform for high-quality internal knowledge exchange, overall similarity to that configuration should strengthen the relationship between innovation and firm performance [33].

Our study aims to make two contributions to innovation literature. First, our consideration of the moderating effects of factors that represent a firm’s internal context and facilitate cross-functional knowledge exchange identifies some key internal boundary conditions for the effective implementation of innovation. Second, we offer a systems perspective—a perspective borrowed from strategy literature, which has not been used much in innovation research—that provides an important theoretical tool for the *collective* consideration of multiple organizational contingencies for the relationship between innovation and firm performance. To this end, we identify and discuss an “ideal” configuration of the organization’s internal context that is most conducive to high-quality cross-functional knowledge exchange, and we argue that organizations with a closer adherence to this configuration will exhibit a stronger link between their level of innovation and performance.

II. THEORETICAL BACKGROUND

We seek to understand the internal contingencies underlying the innovation–firm performance relationship in the context of collaboration between mid-level managers who are responsible for functional areas such R&D, engineering, marketing, sales, or their combinations [13], [34], [35], whom we label “functional managers.” In doing so, we highlight the importance of the decisions made by mid-level managers for facilitating successful new product development; that is, the enactment of the firm’s innovation strategy is largely in the hands of managers who are not top management [36], [37]. According to this “evolutionary perspective” of organizational adaptation, firms are an ecosystem of entrepreneurial efforts undertaken by mid-level managers who compete for organizational resources and top management attention [36]. Further, these managers oversee the subprocesses involved in implementing an organization’s higher-level, strategic decisions [28] and epitomize the enactment of the firm’s innovative pursuits.

Although innovation can be beneficial for firm performance [2], [10], [12], its benefits do not come about automatically [13]. Functional managers may experience ambiguity regarding how to bring new products or services successfully to the market, given the tacit nature and interdependencies that underlie this process [38], which in turn can lead to frustration and anxiety [39]. Further, the benefits that organizations can reap from innovation might be hampered by uncertainty about how different departments will contribute specific deliverables during the innovation process, such as timely updates about progress made in the actual commercialization of new products in the marketplace [16], [19]. The cross-functional interdependencies associated with organizing new product launches also may create a sense of relinquished power [13], which can function as a disincentive to the free disclosure of function-specific knowledge [22].

The translation of innovation efforts into positive performance outcomes requires an ability to assemble and combine dispersed knowledge across functional boundaries [19]. As mentioned previously, leveraging knowledge to exploit collaborative relationships requires organizational mechanisms that unlock knowledge from its holders [13]. We propose that two conditions marking cross-functional collaboration (decision autonomy and trust) and one managerial attitude toward the organization in general (organizational commitment) are instrumental in this process. *Decision autonomy* is a structural feature of cross-functional collaboration and pertains to the extent to which decision making is decentralized [27]. It captures the extent to which functional managers have more perceived control over their interactions with one another [40] and thus their capability to exchange and combine knowledge across departmental boundaries [38]. *Trust* reflects a relational aspect of cross-functional collaboration and captures functional managers' belief that others will act benevolently toward them even when the possibility for opportunism exists [41], [42]. Thus, it encompasses a willingness to render oneself vulnerable to the actions of others [24], and it can facilitate the exploitation of knowledge embedded in intra-organizational relationships [43]. Finally, *organizational commitment* reflects the extent to which functional managers identify with and are involved in their organization [25], [44] and therefore are motivated to pursue its goals [45]. Similar to the other two factors, organizational commitment plays an important role in the promotion of intra-organizational knowledge development and sharing [29].

The study's conceptual model, as summarized in Figure 1, focuses on the contingencies that underlie the relationship between innovation and firm performance. As mentioned, we first discuss the individual moderating effects of the three contextual variables on the relationship between innovation and firm performance. In line with a systems perspective on organizational

contingencies [31], we next consider how a more complex, holistic configuration of these constructs may influence the contribution of innovation to firm performance.

[Insert Figure 1 about here]

A. Moderating Effect of Decision Autonomy

An important cross-functional arrangement pertains to the level of decentralization [27], [38], which is enacted through the level of decision autonomy awarded to functional managers. Decision autonomy reflects functional managers' beliefs that they are in control of their behaviors and have the support of top management to make discretionary decisions [27]. It is also akin to the notion of "organizational support," as reflected in top management's propensity to provide functional managers access to resources and stimulate them to take initiatives [46]. The counterpart of decision autonomy is centralization, or the degree to which decisions must be approved initially by top management.

We expect that the contribution of firms' innovation pursuits to their performance will be higher when the decision autonomy granted to functional departments is higher. As mentioned, the successful implementation of innovation pursuits requires functional managers to openly share knowledge with peers in other departments [20], but there is a danger that such knowledge exchange requires relinquishing power to others [13], [22]. Moreover, knowledge from other departments cannot always be easily understood, absorbed, or integrated in the existing body of knowledge [47], especially when functional managers experience an initial hurdle in freely accessing such knowledge [28]. In response, granting decision autonomy to individual managers may help them understand the benefits of cross-functional knowledge for the successful implementation of firms' innovation pursuits, because it helps them detect and address other departments' knowledge gaps during new product commercialization, without having to ask for

permission from superiors [27]. When granted decision autonomy, functional managers can freely choose their own relationship linkages and development paths and thereby gain a better understanding of how to coordinate with peers in other departments to bring new products or services successfully to the market [38], [40], as well as how to respond effectively to the changing operational and market environments during the implementation of the innovation [48].

In contrast, the presence of strongly centralized decision making (or low decision autonomy) may stifle collaboration, responsiveness, and creativity [49], which represent the hallmarks of the successful implementation of firms' innovation pursuits [13]. In this sense, centralization may motivate functional managers to carry out only their assigned, function-specific tasks, with little interest in participating in the cross-functional collaboration needed for the effective implementation of innovation. Finally, strong centralization may convey limited organizational support for guiding functional managers through the uncertainty associated with launching new products in the marketplace [13], [27] and thus decrease their motivation to see innovative projects through until the end, especially when they confront unexpected hurdles and challenges during their implementation.

H₁: The relationship between innovation and firm performance is moderated by the level of decision autonomy, such that the coefficient for innovation is higher at higher levels of decision autonomy.

B. Moderating Effect of Trust

A second cross-functional condition deemed instrumental for the performance outcomes of firms' innovation pursuits is the level of trust functional managers have in one another [43]. We envision trust as exchange partners' positive expectations about others' motives in situations that entail risk and vulnerability [24], [50]. The development of trust is critical in situations marked by uncertainty, because it instills a "willingness of a party to be vulnerable to the actions

of another party on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor and control that other party” [51, p. 712]. We offer several reasons for its amplifying effect on the innovation–firm performance relationship.

First, trust reduces the time and money consumed in monitoring the behavior of functional peers [42] and therefore enables managers to devote more time to productive activities, such as figuring out how their own knowledge can combine effectively with that of others to bring new products to the market [52], [53]. Second, cross-functional interactions are often marked by a certain level of “coopetition,” whereby functional managers not only collaborate with one another but also compete for the firm’s scarce resources in the pursuit of personal credit for successful innovation outcomes [54]. Therefore, when functional managers are confident that their colleagues will *not* take advantage of them—for example, by demanding excess resources irrespective of other departments’ needs—even if the opportunity arises, their collaborative efforts in bringing new products or services to the market should be more effective, given their greater willingness to exchange privileged and confidential knowledge [55]. In a similar vein, trust reduces fears of criticism or looking foolish [56] and enhances the willingness of functional managers to go out of their way to push newly developed products to successful commercialization [57]. When trust exists, functional managers should be more prone to ask for help and take risks when making new products ready for the marketplace [26], [53], which increases the potency of firms’ innovation pursuits to translate into improved performance.

H₂: The relationship between innovation and firm performance is moderated by the level of trust, such that the coefficient for innovation is higher at higher levels of trust.

C. Moderating Effect of Organizational Commitment

The notion of organizational commitment conceives of functional managers as having an exchange relationship with their organization [58]; thus, it captures the extent to which functional managers identify with and are involved in their organization [25] and motivated to pursue its goals [45]. The successful introduction of new products in the market is an ambiguous process that demands extraordinary levels of commitment, conviction, and enthusiasm from managers across the organization [34], [59]. In many cases, individual managers encounter the challenge of internal red tape before they receive the support from top management necessary to bring a new product or service successfully to the market [60], [61].

We offer several arguments for how increased organizational commitment may strengthen the innovation–firm performance relationship. Functional managers who strongly identify with their organization and are highly involved in it likely share more knowledge with others when bringing new products to market because their attitude increases their perception that knowledge sharing is appreciated and that their knowledge eventually will be used by and helpful to their organization [25], [62]. Similarly, strongly committed managers attach substantial importance to how they are perceived by others in the organization [63] and thus are less likely to resist sharing knowledge during new product commercialization. Furthermore, organizational commitment may lead functional managers' motivations to change from extrinsic (i.e., concerned about the firm's needs) to intrinsic (i.e., concerned about my firm's needs) [58] and thus increase the passion with which they aim to exploit cross-functional knowledge exchange for the successful implementation of a firm's innovation pursuits [25]. The increased intensity that marks the interactions between highly committed managers can also enhance learning capabilities and insights into how the benefits of new product development can be optimized, because such intensity involves not only repeated efforts to exchange knowledge [64]

but also greater receptivity to others' knowledge [62]. Finally, committed managers may be more likely to support and pursue the integration of function-specific knowledge when bringing new products to the market, because their strong involvement in their daily tasks can make them more *aware* of how such integration is instrumental for the successful conversion of innovative projects into organization-wide performance [59].

H₃: The relationship between innovation and firm performance is moderated by the level of organizational commitment, such that the coefficient for innovation is higher at higher levels of organizational commitment.

D. Moderating Effect of Similarity to Ideal Configuration

Hypotheses 1–3 consider the knowledge-enhancing effect of each of the three moderating variables—decision autonomy, trust, and organizational commitment—individually, ignoring the possibility that this effect may not be optimal if any of the other factors is deficient [31]. In this regard, it is important to note that these three variables often go hand in hand; for instance, decision autonomy may facilitate trust among peers [65], or trust may breed organizational commitment [66]. Yet an equally important argument states that though firms can benefit from the simultaneous presence of high levels of decision autonomy, trust, and organizational commitment, there also may be important costs associated with maintaining such high levels, which means their simultaneous occurrence is not automatic [59], [67]. For example, the installment of participative decision making or encouragement of trust-based relationships may provoke resistance among managers, to the extent that these organizational conditions do not align with their personal dispositions [38], [67]. Organizational commitment may be beneficial for the effective integration of knowledge across departments, but encouraging high levels of such commitment can put a high burden on firms' resource base [22] and even be dysfunctional in cases that it favors the retention of managers who are security-minded and risk averse [59].

We propose that a systems or configurational approach [31], [32] to understanding the *joint* contingency effects of decision autonomy, trust, and organizational commitment can offer valuable insights that complement the consideration of their individual effects. Prior studies in strategy and marketing show how a configuration of contingencies can increase understanding of the simultaneous effects of multiple organizational characteristics on particular organizational outcomes [32], [33], yet to the best of our knowledge, this approach has not received much attention in innovation literature. A holistic configuration of various organizational characteristics can be modeled as an “ideal type” construct, an abstract representation of related yet complex empirical phenomena [68], [69]. Such “ideal types describe the phenomena, consisting of component elements standing in specific relations to each other, which empirically exist when certain conditions are fulfilled” [68, p. 159]. Ideal type constructs are particularly useful to capture the collective effect of theoretical constructs that are intrinsically linked with one another [70]. They represent a unique form of theory building and are of relevance for the investigation of complex, interdependent processes [71]. In essence, the systems approach suggests that the more an organization approaches the ideal combination of its underlying components, the stronger is the instrumentality of these components for increasing firm performance [31]. In turn, the effect of an individual component may be suboptimal if any of the other components is deficient.

We have argued that an organization’s internal context—represented by the level of decision autonomy, trust, and organizational commitment—affects functional managers’ ability to institute effective knowledge exchange, which is essential for the successful conversion of firms’ innovation pursuits into performance. In our study, the “ideal” situation thus pertains to the situation in which the individual components of organizational context take their most

beneficial forms with respect to the quality of intra-organizational knowledge exchange [19], [20] and, consequently, the successful exploitation of innovation toward performance. On the basis of these arguments, we hypothesize that the relationship between innovation and firm performance is stronger when the organizational context comes closer to the “ideal” configuration of its underlying elements. To be precise, a configuration marked by the simultaneous presence of high levels of decision autonomy, trust, and organizational commitment is most favorable for the effective exchange of knowledge within the organization [22] and thus for amplifying the performance potential inherent in firms’ innovation pursuits. In contrast, deviation from this ideal configuration will impede knowledge exchange and accordingly undermine the relationship between innovation and firm performance [71].

H₄: The similarity of the organizational context to the ideal configuration of decision autonomy, trust, and organizational commitment positively moderates the relationship between innovation and firm performance, such that the coefficient for innovation is higher when the similarity is higher.

III. RESEARCH METHODS

A. Sample and Data Collection

To ensure the wide applicability of our findings, we test our hypotheses with a sample of firms active in a variety of industrial sectors. We obtained, from a private market research company, a list of 1,500 randomly selected Canadian firms, representative of the country’s provinces and industrial sectors. Similar to the approaches of prior research [72], we used a single-respondent design and obtained contact information about managers active in technical (R&D or engineering) or commercial (marketing or sales) functions. We then sent a survey instrument to one randomly selected functional manager per firm. To pretest the survey and ensure that our questions were clear and understandable, we undertook informal interviews with

six randomly chosen functional managers (three technical and three commercial) who were not included in the initial sample and with whom we discussed the survey instrument as well as the challenges associated with cross-functional cooperation in their respective firms. Their input helped us improve the readability and relevance of our survey instrument.

Our data collection relies on Dillman's [73] total design method. We prepared a mailing packet containing (1) a cover letter addressed personally to the functional managers of the sampled firms, (2) a questionnaire, and (3) a postage-paid return envelope. Two weeks after the initial mailing, we conducted "thank you" calls to those who had responded and reminder calls to those who had not. Four weeks after the initial mailing, we sent replacement questionnaires to nonrespondents. Some initially selected firms were unfit for the final sample because they were not active any more, had moved and their new address could not be identified, or no longer employed the selected respondents. We ended with 950 potential respondents and received 232 completed surveys, for a response rate of 24%, which is consistent with other studies pertaining to innovation and social exchange [74]. The responding firms operate in a wide variety of sectors, including manufacturing (standard industrial classification [SIC] 20–39), nonfinancial services (SIC 70–89), mining (SIC 10–14), construction (SIC 15–17), transportation (SIC 40–49), wholesale (SIC 50–51), retail (SIC 52–59), and finance (SIC 60–67). No substantial differences mark respondents and non-respondents or early and late respondents [75].

Following prior research [55], we tested the validity of the study's key constructs by administering a follow-up survey six months after the initial one. In the follow-up survey, we used a shortened format of the original questionnaire; for each construct, we chose one proxy item, different from the specific items in the original survey, that captured best the content

domain of the construct [76]. We received 78 responses to the follow-up survey and found that all validation items correlated positively with the original measures.

B. Measures of Constructs

In Table I, we list the measures used in our analysis, detailing their individual items, overall reliability estimates (Cronbach's alpha, composite reliability), and average variance extracted (AVE).

[Insert Table I about here]

1) Performance. Our performance measure consists of an exhaustive list of nine indicators used in prior research [2] to capture items such as return on investment and sales growth. For each indicator, respondents assessed their perceptions of the firm's performance relative to that of its principal competitors during the past three years. The measure ($\alpha = .92$), based on the average of the nine indicators, correlates positively with its single-item counterpart in the follow-up survey ($r = .66, p < .001$).

2) Innovation. Following prior research [4], [5], we measure the level of firms' innovation pursuits using seven items that reflect the extent to which the firm develops new products and services or pursues innovations for customers or markets (e.g., commercializing products and services that are new to the company, exploiting new opportunities in new markets). The measure ($\alpha = .85$) correlates positively with its single-item counterpart from the follow-up survey ($r = .43, p < .001$).

3) Decision autonomy. Following prior studies [77], we measure the level of decision autonomy with four items that reflect the extent to which decision making is decentralized by top management. The questions are reverse coded in the survey. For example, we asked respondents to what extent individual departments needed to get permission from top management when they

wanted to make a decision. The measure ($\alpha = .90$) correlates positively with its single-item counterpart from the follow-up survey ($r = .41, p < .001$).

4) *Trust.* Drawing from literature on interpersonal trust [78] and interfirm trust [66], we measure the overall level of trust between functional managers across departmental borders using a five-item scale. Respondents indicated, for example, whether people from other functions kept their promises and avoided taking advantage of them, even if the opportunity arose. The measure ($\alpha = .87$) correlates positively with its single-item counterpart from the follow-up survey ($r = .36, p < .001$).

5) *Organizational commitment.* We use Allen and Meyer's [79] four-item scale to measure functional managers' organizational commitment, assessing the extent to which they feel a strong belonging to the organization or would be happy to spend the rest of their career with their company. The measure has good reliability (Cronbach's α of .91) and correlates positively with its counterpart in the follow-up survey ($r = .34, p < .001$).

6) *Similarity to ideal configuration.* Ideal type patterns among variables can be generated either theoretically or empirically [71]. When clear judgments can be made about the ideal values of each component construct, the theoretical approach is most consistent with the logical structure of typological theories [71]. In addition, empirical approaches require arbitrary decisions about what constitutes high performance and may reduce the statistical power for testing hypotheses [33]. Therefore, we used a theoretical approach to specify the ideal configuration of decision autonomy, trust, and organizational commitment. The three constructs were measured on the same 1–5 scale, so we judged the highest value (5) as representing the most beneficial empirical representation of each construct. The ideal configuration constitutes the combination in which these three constructs obtain their highest values. Consistent with prior

work [31]–[33], we calculated the Euclidean distance of each firm from this ideal configuration. We then converted this distance into its opposite, negative value to represent it as similarity to the ideal configuration (i.e., higher values reflect higher similarity). Formally, our measure of similarity to the ideal configuration can be summarized as $\text{Similarity}(i) = -\sqrt{\sum (X_{ij} - X_{mj})^2}$, where X_{ij} represents the value of attribute j (decision autonomy, trust, and organizational commitment) for firm i , and X_{mj} represents the maximum (i.e., ideal) value for that attribute.

7) Control variables. We include several control variables to avoid model misspecification and take into account possible alternative explanations for variations in performance. First, we control for *firm size*, measured as a log transformation of the number of full-time employees. Second, we control for *firm age*, measured as the number of years the firm has been in business. Third, we note the *industry* of the firm using a SIC-based classification.¹ Fourth, we control for whether the respondent represents a technical (R&D or engineering) or commercial *function*, or both.²

C. Assessing the Reliability and Validity of Measures

In line with Anderson and Gerbing [80], we estimate a five-factor measurement model using AMOS 6.0. Confirmatory factor analysis (CFA) reveals factor loadings greater than .40, normalized residuals less than 2.58, and modification indices less than 3.84. These results suggest that no deletions of scale items are needed to improve model fit. We also note that the measurement model fits the data well: $\chi^2_{(347)} = 459.20$, goodness-of-fit index (GFI) = .89,

¹ In supplementary analyses, instead of using a SIC-based classification, we classified industries into “high-tech” or “low-tech,” based on the respondents’ description of their industry and information listed on the companies’ Web sites. With this classification as a control variable, we obtained results consistent with those reported here (Table 3). The effect of the high-tech industry indicator is not significant.

² The respondents indicated their functional area from among the following options: R&D, engineering, marketing, and sales (they could mark more than one option). We constructed three categories: (1) technical function (R&D, engineering, or both), (2) commercial function (marketing, sales, or both), and (3) mixed function (R&D or engineering *and* marketing or sales). The former category served as the base case in the regression analyses.

Tucker-Lewis index (TLI) = .97, confirmatory fit index (CFI) = .97, and root mean squared error of approximation (RMSEA) = .04.

We affirm the convergent validity of our scales with the significant factor loadings in the measurement model ($t > 2.0$) and the magnitude of our AVE estimates (equal to or greater than .50). Several assessment criteria also support the discriminant validity of our constructs. None of the confidence intervals for the correlations between constructs includes 1.0 ($p < .05$), and the AVE estimates of the constructs are greater than the squared correlations between the corresponding pairs of constructs. In addition, we find significant differences between the unconstrained model and a constrained model for all 10 pairs of constructs, such as those between decision autonomy and trust ($\Delta\chi^2_{(1)} > 197.84, p < .001$), trust and organizational commitment ($\Delta\chi^2_{(1)} > 27.61, p < .001$), and decision autonomy and organizational commitment ($\Delta\chi^2_{(1)} > 242.08, p < .001$).

We conduct several diagnostic analyses to rule out the possibility of common method bias in our results. First, we conduct a CFA for a single-factor model and find poor fit with the data ($\chi^2_{(357)} = 2075.06$, GFI = .60, TLI = .54, CFI = .59, RMSEA = .14), significantly worse ($\Delta\chi^2_{(10)} = 1615.86, p < .001$) than the fit of the five-factor model. Second, we compare several pairs of structural equation models (SEM) in which we pair a model that includes an interaction term with another model in which we add a common method factor [67]. For the SEM that includes the innovation \times decision autonomy interaction (i.e., the equivalent of Model 4, Table III), the comparison reveals virtually no differences in the fit indices between the model without the common method factor ($\chi^2_{(87)} = 155.176$; GFI = .932, TLI = .933, CFI = .929, RMSEA = .058) and the corresponding model with the added common method factor ($\chi^2_{(86)} = 154.916$; GFI = .932, TLI = .932, CFI = .929, RMSEA = .059). The chi-square difference between the two

models is not significant ($\Delta\chi^2_{(1)} = .260$; ns), and only small changes in the size and significance of the paths across the two models emerge. The same pattern of results emerges for the SEM equivalents of the models in which the other two-way interactions are included. These results, together with arguments that common method bias is less prevalent in studies using highly educated respondents and multi-item scales [81] and for moderating effects relative to main effects [82], alleviate possible concerns related to the use of a common respondent in our study.³ Third, to alleviate concerns about common method bias, we also check the robustness of our results when using two alternative performance variables, drawn from a secondary data source, for a subsample of firms. The details of these post-hoc analyses and their results are reported next.

IV. RESULTS

We provide the correlations and descriptive statistics for the study's variables in Table II. We apply moderated hierarchical regression analysis with a mean-centering procedure to test our hypotheses [83]. In Table III, we show the regression results for various models that include different groups of variables. Model 1 contains only the control variables; Model 2 adds the direct effect of innovation; Model 3 adds the three organizational context variables; Models 4–6 each add one of the two-way interaction terms; Model 7 adds the three two-way interaction terms simultaneously; and Model 8 adds the interaction term between innovation and similarity to the ideal configuration. In light of the study's focus on moderating effects, it is important to note that the change in explained variance between Model 3 and Models 4–7 is significant ($p < .05$). Model 2 indicates a positive relationship between innovation and firm performance ($p < .001$).

[Insert Tables II and III about here]

³ We further note that we used a proxy item in the follow-up survey, which differs from the items used in the first survey. This approach increases confidence that the positive and significant correlations between the original and follow-up items can be interpreted as evidence contrary to the presence of common method bias [55], [76].

Hypotheses 1–3 predict positive moderating effects of the three contextual variables on the relationship between innovation and firm performance. Model 4 reveals a positive and strongly significant interaction effect between innovation and decision autonomy ($\beta = .146, p < .01$). To understand the nature of the interaction, we plot the effects of innovation on firm performance for high and low levels of decision autonomy [83], as illustrated in Figure 2, Panel A. As the plot suggests, the innovation–firm performance relationship is positive at high levels of decision autonomy and negative at low levels. This finding provides strong support for Hypothesis 1. In Model 5, the interaction effect between innovation and trust on firm performance is positive and significant ($\beta = .138, p < .05$), and the corresponding plot in Figure 2, Panel B, shows that the innovation–firm performance relationship is positive at high levels of trust and almost nonexistent at low levels, in support of Hypothesis 2. Finally, in Model 6, the interaction effect between innovation and organizational commitment on firm performance is positive and highly significant ($\beta = .132, p < .01$). Its plot in Figure 2, Panel C, indicates that the innovation–firm performance relationship is positive at high levels of organizational commitment and negative at low levels. This finding provides strong support for Hypothesis 3.

When we include the three interaction terms simultaneously in Model 7, the three interaction terms are positive, as expected, but only one of them (i.e., innovation \times trust) is significant. Considering the complexity of interpreting individual interaction terms in the presence of other interfering interaction effects, the consistency of the signs of the interaction effects in Model 7 with those in Models 4–6 underscores the robustness of our findings.⁴

Furthermore, each interaction effect of two (mean-centered) focal variables in Model 7

⁴ The simultaneous inclusion of multiple interaction terms may prevent the detection of true moderating effects, due to multicollinearity and the complex constellation of multiple factors [84]. Yet a full model that includes all interaction terms can serve as a robustness check of the results when the signs of the interactions are consistent with those in models that include the interaction terms separately [85], [86]. The results in Table III provide evidence of this consistency.

represents the magnitude of moderation when the other two moderation effects are zero, that is, when the other (mean-centered) moderators take their average values. In light of our configurational Hypothesis 4, the lower values of the individual moderation effects in Model 7 are thus consistent with the interdependencies among the three moderators.

Finally, Hypothesis 4 suggests that to the extent that an organization's context is more similar to the ideal configuration of decision autonomy, trust, and organizational commitment, the relationship between innovation and firm performance is stronger. In Model 8, we add the interaction effect between innovation and similarity to ideal configuration (together with the main effect of similarity). This interaction effect is positive and strongly significant ($\beta = .104, p < .01$). The interaction plot (Figure 2, Panel D) shows that the innovation–firm performance relationship is positive at high levels of similarity but neutral at low levels. Overall, these results provide strong support for Hypothesis 4.

We undertake two post-hoc analyses to check the robustness of our results. First, because our dependent variable is censored, we ran regressions with a Tobit specification to account for such censoring [87]. The results remain fully consistent, in that decision autonomy, trust, and organizational individually, as well as together in the form of the similarity to the ideal configuration, positively and significantly interact with innovation in predicting firm performance.⁵ Second, to check for common method bias, we collected additional performance data from the Hoovers Online Prospector Database. Specifically, we captured data regarding firms' revenue growth (for a subsample of $N = 107$) and income growth (for a subsample of $N = 70$). As we show in Table IV, the results of these subsample analyses are consistent with those revealed by the full sample in Table III: The moderating effects between innovation on one hand

⁵ The results are not reported due to space constraints but are available from the first author upon request.

and decision autonomy, trust, organizational commitment, and similarity to the ideal configuration on the other hand are positive and significant.

[Insert Table IV about here]

To gain insight into which pair of the three contextual variables may be most potent for the translation of innovation into firm performance, we create three “ideal subconfigurations” for all three pairs of moderating variables and compare the strength of the corresponding interaction effects (i.e., multiplication of innovation and the respective similarity to the ideal subconfiguration variable). Although the interaction effect between innovation and the decision autonomy–organizational commitment subconfiguration is strongest ($\beta = .126, p < .001$), followed by that of the decision autonomy–trust subconfiguration ($\beta = .116, p < .05$) and the trust–organizational commitment subconfiguration ($\beta = .098, p < .05$), the z-tests [88] reveal no significant differences among the regression coefficients. This result corroborates our implied argument that the contextual factors—decision autonomy, trust, and organization commitment—collectively play equally important roles in the conversion of innovation into firm performance.

V. DISCUSSION

We argue that the translation of innovation into firm performance does not occur automatically and benefits from overcoming barriers for collaboration among different functional departments [26], [38], as well as from creating deep involvement among individual managers with their organization [25], [89]. To this end, this study explicates two aspects of cross-functional collaboration (i.e., decision autonomy and trust) and one key managerial attitude toward the organization in general (i.e., organizational commitment) as intra-organizational boundary conditions that shape the extent to which firms’ innovation pursuits can lead to greater performance. We find empirical support for the three contingency hypotheses regarding the

individual contingent effect of decision autonomy, trust, and organizational commitment. We also find support for the configurational hypothesis pertaining to their combined effect [32]. Our approach contributes to the scholarly conversation about internal conduits for the performance effects of innovation [5], [19], [61], [90]. We next discuss the theoretical implications of our findings and comment on the study's limitations, research possibilities, and practical implications.

A. Theoretical Implications

Decision autonomy amplifies the performance benefits inherent to innovation. To the extent that functional departments gain more autonomy from top management, firms' innovation pursuits can be converted more successfully into performance outcomes. Decision autonomy increases the perceived feasibility of and support for cross-functional knowledge exchange [27], [46], which is instrumental for the conversion of new product or market development opportunities into organizational performance [19], [20]. In contrast, when organizations are marked by low decision autonomy, the successful leverage of knowledge across functional boundaries is hampered [91], and firms' innovation pursuits may even reduce performance (Figure 2, Panel A). Absent decision autonomy, functional managers carry out only assigned, function-specific tasks, with little motivation to use the insights of peers, even if those insights are necessary for firms' new products to come successfully to market [38].

In addition, trust amplifies the positive relationship between innovation and firm performance. When functional managers have full confidence in one another's honesty and truthfulness, they invest more in productive exchanges that unlock function-specific knowledge rather than in activities aimed at monitoring and checking whether other departments will take advantage or gain unjustified credit when implementing the firm's innovation pursuits [24], [41],

[42]. Thus, high levels of trust enhance fruitful communication across functional boundaries when bringing newly developed products to market, which amplifies the performance potential inherent in innovation. We observe that at low levels of trust, the innovation–firm performance link becomes neutral (Figure 2, Panel B). Extremely low levels of trust might prevent functional managers from sharing the knowledge that is necessary for the full exploitation of innovation, perhaps because people hate to relinquish power when sharing knowledge with untrustworthy exchange partners [22], and therefore, the ability to find effective ways to bring new products to the market declines [28]. In such cases, a lack of knowledge exchange may increase the uncertainty and costs associated with the implementation of innovation [13], [15].

We observe a similar pattern with respect to the moderating effect of organizational commitment on the innovation–firm performance relationship (Figure 2, Panel C). The extent to which functional managers identify with and are involved in their organization reflects a willingness to interact intensively and cooperate closely with peers in the organization [61], [62]. Although such an interaction is instrumental for the successful implementation of firms' innovation pursuits, the lack of organizational commitment may prove counterproductive when, in the absence of functional managers' strong bonds with the organization, they are not motivated to channel or control the uncertainty or costs associated with bringing new products to the marketplace [13], [59]. A lack of commitment can reduce managers' motivation to see innovative projects through to the end, especially when they confront unexpected drawbacks or internal red tape during their implementation, as noted by a marketing manager [92, p. 432]: "I try to deal with things in a rational way, but that's not necessarily the way other groups operate around here. Many things that were planned for the product six, eight, ten months ago weren't ever really committed to by manufacturing."

The finding with regard to the configurational effect of the three components of organizational context sheds further light onto how to optimize the performance outcomes of innovation (Figure 2, Panel D). Beyond the individual moderating effects of decision autonomy, trust, and organizational commitment, we find a strong holistic effect of these contextual factors. To the extent that there is a deviation between the actual and “ideal” configuration, firms cannot fully reap the benefits from their pursuit of innovation [31], [32]. We posit that this configurational effect emerges because decision autonomy, trust, and organizational commitment represent a meaningful “gestalt” of interrelated factors [93] that collectively enhance open knowledge flows within the organization [22]. Thus, the beneficial effect of these contextual variables on the instrumentality of firms’ innovation pursuits may not be maximized if any of them is deficient [31]. Each feature can encourage managers to exchange knowledge, but their simultaneous presence prompts more open, reciprocal, and sustainable cooperation [22], [32]. A deficiency in any of these elements of organizations’ context may undermine productive, cooperative climates and ultimately impede the extent to which innovation leads to higher performance. Our findings suggest then that innovation research benefits from considering the role of intra-organizational factors, such as those studied herein, from a holistic perspective rather than individually, as well as from addressing their joint effects.

B. Limitations, Further Research, and Practical Implications

We acknowledge that our study has some limitations, which offer opportunities for further research. First, though our configurational hypothesis highlights the necessity of considering the simultaneous roles of decision autonomy, trust, and organizational commitment in converting innovation into firm performance, additional research could examine the specific interdependencies that exist among these three variables, including the trade-offs that top

management must make when it confronts the high costs of maintaining high levels of all three variables [59], [67]. In some cases, it may be more cost effective to focus on one particular factor, while devoting less attention to the others. Alternatively, there may be synergistic effects among the three factors. Further research could also examine whether the amplification effects of the contextual variables are curvilinear, in that they decrease beyond a certain point.

Second, we focus on the contingent effect of contextual factors on the successful implementation of only one particular dimension of a firm's strategic posture, namely, its pursuit of innovation, defined herein as the extent to which a firm pursues the development of new products and services or exploits new market opportunities [4], [5]. Additional research could explicate the contingency effects of the variables on the relationship between different facets of innovation, such as incremental versus radical [94] and firm performance, as well as assess how our findings relate to other strategic postures. For example, according to our theoretical reasoning, because decision autonomy is more likely to provide effective solutions in situations characterized by complexity that asks for intensive knowledge exchange, firms that emphasize adaptability [46] or technological differentiation [95] may benefit most from arrangements that allow for managerial participation in decision making. Yet promoting such decision autonomy may lead to unsuccessful outcomes in firms that emphasize efficiency and economies of scope [96].

Third, for parsimony, we focus on three specific contingency factors that influence the relationship between innovation and firm performance. Research could consider how other internal conditions, such as job rotation [25] or organizational citizenship behavior [97], might shape the innovation–firm performance relationship.

Fourth, though we collected alternative data to check for common method bias (i.e., through a follow-up survey and a secondary source), the presence of such bias cannot be completely eliminated.

Fifth, our results are based on firms in Canada. Although we do not expect much variation in the findings between the Canadian and other Western contexts, cultural factors could interfere with the arguments we apply. Further research should examine, for example, whether in more collectivist cultures [98] decision autonomy represents a cross-functional condition that decreases rather than increases the effectiveness of innovation.

Sixth, our functional classification may not capture the distinct nature of commercial or new product development managers properly for some firms; additional research designs might better depict these unique characteristics of various types of managers.

From a practical point of view, our examination of the contingency effects of contextual factors on the successful implementation of innovation could guide firms to match their strategic posture with internal practices. Thus, this study highlights for top management how the establishment and maintenance of a supportive organizational climate can be instrumental for the effective conversion of innovation into firm performance [27], [61]. Overall, our findings suggest that a firm will benefit more from its innovation pursuits when it grants decision autonomy to functional managers, promotes trust-building in their mutual interactions, and instills among its managers a strong identification with their organization and its goals. Thus, when appropriate structural and relational arrangements for cross-functional exchange are in place, managers may devote less energy in protecting their own “turf” and interests and instead focus on accomplishing synergies between their own and others’ expertise. Granting decision autonomy to functional managers helps them meet technical objectives, speed up the

implementation of innovative solutions, and optimize the leverage of function-specific knowledge to benefit the whole organization when bringing new products to market [38]. To create and foster a healthy trust-based culture across functional departments, firms could adopt various strategies for interpersonal trust-building, such as promoting fairness, integrity, and receptivity to others' opinions [99]. In addition, fostering an internal climate that inspires commitment to organizational goals—perhaps by clearly defining and communicating these goals and valuing each manager's contribution to them—can create an environment of free expression and knowledge exchange among different functional areas that should make successful innovation pursuits more attainable. Thus, a firm must generate buy-in from across different functional areas with respect to the innovative goals that it pursues before its innovation pursuits can be implemented successfully [25], [59]. Finally, our findings provide insight into the selection criteria that firms with innovative aspirations should maintain. Not only should functional managers be proficient in their respective domains of expertise, but they must be effective team players, willing to go out of their way to exploit the autonomy granted to them, build and cultivate a “social community” of trustworthy exchange partners, and identify with the firms' goals to bring new products and services successfully to the marketplace.

In conclusion, we hope this study directs greater attention to the internal contingencies underlying the relationship between innovation and firm performance. It offers a first attempt to advance understanding of the combined role of structural, relational, and attitudinal components in this process and could serve as a stepping stone for a better understanding of how firms can translate their innovation pursuits into stronger market and competitive positions.

REFERENCES

- [1] D'Aveni, R.A. 1994. *Hypercompetition: Managing the Dynamics of Strategic Maneuvering*. New York, The Free Press.
- [2] Li, H. and Atuahene-Gima, K. 2001. Product innovation strategy and performance of new technology ventures in China. *Academy of Management Journal*, 44: 1123-1134.
- [3] Kafouros, M.I., 2008. *Industrial Innovation and Firm Performance: The Impact of Scientific Knowledge on Multinational Corporations*. Edward Elgar.
- [4] Jansen, J., Van Den Bosch, V., and Volberda, H. 2006. Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management Science*, 52: 1661-1674.
- [5] Mansury, M.A. and Love, J.H. 2008. Innovation, productivity and growth in US business services: A firm-level analysis. *Technovation*, 28: 52-62.
- [6] Ettlie, J. and Bridges, W.P. 1982. Environment uncertainty and organizational technology policy. *IEEE Transactions on Engineering Management*, 29: 2-10.
- [7] Wakelin, K. 2001. Productivity growth and R&D expenditure in UK manufacturing firms. *Research Policy*, 30: 1079-1090.
- [8] Capon, N., Farley, J.U., and Hoenig, S. 1990. Determinants of financial performance: A meta-analysis. *Management Science*, 36: 1143-1159.
- [9] Kafouros, M.I., Buckley, P.J., Sharp, J.A., and Wang, C. 2008. The role of internationalization in explaining innovation performance. *Technovation*, 28: 63-74
- [10] Adams, J.D. and Jaffe, A.B. 1996. Bounding the effects of R&D: an investigation using matched establishment-firm data. *RAND Journal of Economics*, 27 (4): 700-721.
- [11] Hall, B. and Mairesse, J. 1995. Exploring the relationship between R&D and productivity in French manufacturing firms. *Journal of Econometrics*, 65: 263-293.
- [12] Kafouros, M.I. 2005. R&D and productivity growth: Evidence from the UK. *Economics of Innovation and New Technology*, 14 (6): 479-497.
- [13] Hitt, M.A., Hoskisson, R.E., and Nixon, R. 1993. A mid-range theory of interfunctional integration, its antecedents and outcomes. *Journal of Engineering and Technology Management*, 10: 161-185.
- [14] Yang, S. and Kang, H-H. 2008. Is synergy always good? Clarifying the effect of innovation capital and customer capital on firm performance in two contexts. *Technovation*, 28 (10): 667-678.
- [15] Marquis, D.G. 1969. The anatomy of successful innovations. *Innovation* (November). Reprinted in Tushman, M.L. and Moore, W.L. (Eds.) 1988. *Readings in the Management of Innovation*, 2nd ed., Cambridge, MA, Ballinger, 79-87.
- [16] Cooper, R.G. 2001. *Winning at New Products: Accelerating the Process from Idea to Launch*, 3rd ed. Reading, MA, Perseus Books.
- [17] Griffin, A. and Hauser, J.R. 1996. Integrating R&D and marketing: A review, and analysis of the literature. *Journal of Product Innovation Management*, 13: 191-215.
- [18] Leenders, M. and Wierenga, B. 2002. The effectiveness of different integration mechanisms for integrating marketing and R&D. *Journal of Product Innovation Management*, 194: 305-317.
- [19] Alegre, J. and Chiva, R. 2008. Assessing the impact of organizational learning capability on product innovation performance: An empirical test. *Technovation*, 28: 315-326.
- [20] Love, J.H. and Roper, S. 2009. Organizing innovation: Complementarities between cross-functional teams. *Technovation*, 29: 192-203.

- [21] Berends, H., Van der Bij, H., Debackere, K., and Weggeman, M. 2006. Knowledge sharing mechanisms in industrial research. *R&D Management*, 36 (1): 85-95.
- [22] Kim, W. C. and Mauborgne, R. 1998. Procedural justice, strategic decision making, and the knowledge economy. *Strategic Management Journal*, 19: 323-338.
- [23] Hauptman, O. and Hiriji, K. 1999. Managing integration and coordination in cross-functional teams: An international study of concurrent engineering product development. *R&D Management*, 29 (2): 179-192.
- [24] Dayan, M., Di Benedetto, C.A., and Colak, M. 2009. Managerial trust in new product development projects: Its antecedents and consequences. *R&D Management*, 39 (1): 21-37.
- [25] Song, M., van der Bij, H., and Weggeman, M. 2006. Factors for improving the level of knowledge generation in new product development. *R&D Management*, 36 (2): 173-187.
- [26] Garcia, N., Sanzo, M.J., and Trespalacios, J.A. 2008. New product internal performance and market performance: Evidence from Spanish firms regarding the role of trust, interfunctional integration, and innovation type. *Technovation*, 28: 713-725.
- [27] Malik, S.D. and Wilson, D.O. 1995. Factors influencing engineers' perceptions of organizational support for innovation. *Journal of Engineering and Technology Management*, 12: 201-218.
- [28] Floyd, S.W. and Lane, P.J. 2000. Strategizing throughout the organization: Managing role conflict in strategic renewal. *Academy of Management Review*, 25 (1): 154-177.
- [29] Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. *Organization Science*, 5: 14-37.
- [30] Grant, R.M. 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17 (Winter): 109-122.
- [31] Drazin, R. and Van de Ven, A. H. 1985. Alternate forms of fit in contingency theory. *Administrative Science Quarterly*, 30: 514-539.
- [32] Vorhies, D.W. and Morgan, N.A., 2003. A configuration theory assessment of marketing organization fit with business strategy and its relationship with marketing performance. *Journal of Marketing*, 67 (1): 100-115.
- [33] Govindarajan, V. 1988. A contingency approach to strategy implementation at business-unit level: Integrating administrative mechanism with strategy. *Academy of Management Journal*, 31: 826-853.
- [34] Lee, C. and Chen, W-L. 2007) Cross-functionality and charged behavior of the new product development teams in Taiwan's information technology industries. *Technovation*, 27: 605-615.
- [35] Nihtila, J. 1999. R&D-production integration in the early phases of new product development projects. *Journal of Engineering and Technology Management*, 16: 55-81.
- [36] Burgelman, R A. (1991). Intraorganizational ecology of strategy making and organizational adaptation: Theory and field research. *Organization Science*, 2: 239-262.
- [37] Floyd, S.W. and B. Wooldridge. (1997). Middle management's strategic influence and organizational performance. *Journal of Management Studies*, 34: 465-485.
- [38] Gerwin, D. and Moffat, L. 1997. Authorizing processes changing team autonomy during new product development. *Journal of Engineering and Technology Management*, 14: 291-313.
- [39] Kahn, K.B. 1996. Interdepartmental integration. A definition with implications for product development performance. *Journal of Product Innovation Management*, 13: 137-151.

- [40] Chen, C.-J. 2007. Information technology, organizational structure, and new product development: The mediating effect of cross-functional team interaction. *IEEE Transactions on Engineering Management*, 54 (4): 687-698.
- [41] Bock, G.-W., Sabherwal, R., and Qian, Z. 2008. The effect of social context on the success of knowledge repository systems. *IEEE Transactions on Engineering Management*, 55(4): 536-551.
- [42] Chen, M.-H., Chang, Y.-C., and Hung, S.-C. 2008. Social capital and creativity in R&D project teams. *R&D Management*, 38 (1): 21-34.
- [43] Tsai, W. and Ghoshal, S. 1998. Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41: 464-476.
- [44] Mowday, R.T., Steers, R.M., and Porter, L.W. 1979. The measurement of organizational commitment. *Journal of Vocational Behavior*, 14: 224-247.
- [45] Pool, S. and Pool, B. 2007. Measuring organizational commitment and its impact on job satisfaction among executives in a learning organization. *Journal of Management Development*, 26 (4): 353-369.
- [46] Gibson, C. and Birkinshaw, J. 2004. The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47: 209-226.
- [47] Vega-Jurado, J., Gutierrez-Gracia, A., and Fernandez-de-Lucio, I. 2008. Analyzing the determinants of firm's absorptive capacity: Beyond R&D. *R&D Management*, 38 (4): 392-405.
- [48] Wu, L.-Y. and Wang, C.-J. 2007. Transforming resources to improve performance of technology-based firm: A Taiwanese empirical study. *Journal of Engineering and Technology Management*, 24: 251-261.
- [49] Brennan, A. and Dooley, L. 2005. Networked creativity: A structured management framework for stimulating innovation. *Technovation*, 25 (12): 1388-1399.
- [50] Rousseau, D.M., Sitkin, S.B., Burt, R.S., and Camerer, C. 1998. Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, 23 (3): 393-404.
- [51] Mayer, R.C., Davis, J.H., and Schoorman, F.D. 1995. An integrative model of organizational trust. *Academy of Management Review*, 20(3): 709-734.
- [52] Bstieler, L. 2006. Trust formation in collaborative new product development. *Journal of Product Innovation Management*, 23: 56-72.
- [53] Jassawalla, A.R. and Sashittal, H.C. 1998. An examination of collaboration in high-technology new product development processes. *Journal of Production Innovation Management*, 15: 237-254.
- [54] Luo, X., Slotegraaf, R.J., and Pan, X. 2006. Cross-functional "coopetition": The simultaneous role of cooperation and competition within firms. *Journal of Marketing*, 70 (2): 67-80.
- [55] Yli-Renko, H., Autio, E., and Sapienza, H.J. 2001. Social capital, knowledge acquisition and knowledge exploitation in young technology-based firms. *Strategic Management Journal*, 22 (June-July): 587-614.
- [56] Atuahene-Gima, K. and Murray, J.Y. 2007. Exploratory and exploitative learning in new product development: a social capital perspective on new technology ventures in China. *Journal of International Marketing*, 15 (2): 1-29.
- [57] Dooley, R.S. and Fryxell, G.E. 1999. Attaining decision quality and commitment from dissent: The moderating effects of loyalty and competence in strategic decision-making teams. *Academy of Management Journal*, 42 (4): 389-402.

- [58] Meyer, J.P., Becker, T.E., and Vandenberghe, C. 2004. Employee commitment and motivation: A conceptual analysis and integrative model. *Journal of Applied Psychology*, 89: 991-1007.
- [59] Starling, G. 1991. A framework for understanding commitment in the R&D organization. *Journal of Engineering and Technology Management*, 8: 251-265.
- [60] Brown, W.B. and Karagozoglu, N. 1989. A systems model of technological innovation. *IEEE Transactions on Engineering Management*, 36 (1): 11-16.
- [61] Saleh, S.D. and Wang, C.K. 1993. The management of innovation. Strategy, structure, and organizational climate. *IEEE Transactions on Engineering Management*, 40 (1): 14-21.
- [62] Van den Hooff, B. and Van Weenen, F.D.L., 2004. Committed to share: Commitment and CMC use as antecedents of knowledge sharing. *Knowledge and Process Management*, 11: 13-24.
- [63] O'Reilly, C. I. and Chatman, J. 1986. Organizational commitment and psychological attachment: The effects of compliance, identification, and internalization on prosocial behavior. *Journal of Applied Psychology*, 71 (3): 492-499.
- [64] Blankenburg, D.H., Eriksson, K., and Johanson, J., 1999. Creating value through mutual commitment to business network relationships. *Strategic Management Journal*, 20: 467-486.
- [65] Massey, G.R., and Kyriazis, E. 2007. Interpersonal trust between marketing and R&D during new product development projects. *European Journal of Marketing*, 41(9/10): 1146-1172.
- [66] Morgan, R.M., and Hunt, S.D. 1994. The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58: 20-38.
- [67] Leana, C. R. and van Buren, H.J., III. 1999. Organizational social capital and employment practices. *Academy of Management Review*, 24 (July): 538-555.
- [68] Burger, T. 1987. *Max Weber's Theory of Concept Formation*. Durham, NC, Duke University Press.
- [69] Weber, M. 1904. *Max Weber on the Methodology of the Social Sciences*. E.A. Shills and H.A. Finch (Trans.). Glencoe, IL, The Free Press.
- [70] Stinchcombe, A. 1968. *Constructing Social Theories*. New York, Harcourt, Brace, and World.
- [71] Doty, D.H. and Glick, W.H. 1994. Typologies as a unique form of theory building: Toward improved understanding and modeling. *Academy of Management Review*, 19 (2): 230-251.
- [72] Song, X.M., Dyer, B., and Thieme, R.J. 2006. Conflict management and innovation performance: An integrated contingency perspective. *Journal of the Academy of Marketing Science*, 34: 341-356.
- [73] Dillman, D.A. 2000. *Mail and Internet Surveys: The Tailored Design Method*. New York, John Wiley & Sons.
- [74] Aiken, K.D. and Boush, D.M. 2006. Trustmarks, objective-source ratings, and implied investments in advertising: Investigating online trust and the context specific nature of Internet signals. *Journal of the Academy of Marketing Science*, 34: 308-323.
- [75] Armstrong, J.S. and Overton, T. 1977. Estimating non-response bias in mail surveys. *Journal of Marketing*, 51: 71-86.
- [76] De Clercq, D. and Sapienza, H.J. 2006. Effects of relational capital and commitment on venture capitalists' perception of portfolio company performance. *Journal of Business Venturing*, 21: 326-347.

- [77] Dyer, B. and Song M.X. 1998. Innovation strategy and sanctioned conflict: A new edge in innovation? *Journal of Product Innovation Management*, 15: 505-519.
- [78] Rempel, J.K., Holmes, J.G., and Zanna, M.P. 1985. Trust in close relationships. *Journal of Personality and Social Psychology*, 49 (July): 95-112.
- [79] Allen, N.J. and Meyer, J.P. 1990. The measurement and antecedents of affective, continuance, and normative commitment to the organization. *Journal of Occupational Psychology*, 63: 1-18.
- [80] Anderson J.C. and Gerbing D.W. 1988. Structural equation modeling in practice: A review and recommended two step approach. *Psychology Bulletin*, 1033: 411-423.
- [81] Bergkvist, L. and Rossiter, J.R. 2007. The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of Marketing Research*, 44: 175-184.
- [82] Brockner, J., Siegel, P.A., Daly, J.P., Tyler, T., and Martin, C. 1997. When trust matters: The moderating effect of outcome favorability. *Administrative Science Quarterly*, 42: 558-583.
- [83] Cohen, J., Cohen, P., West, S.G., and Aiken, L.S. 2003. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, 3rd ed. Mahwah, NJ, Erlbaum.
- [84] Neter J., Wasserman W., and Kutner M.H. 1985. *Applied Linear Statistical Models: Regression, Analysis of Variance, and Experimental Design*. Homewood, IL, Richard D. Irwin, Inc.
- [85] Arnold, H. J. 1982. Moderator variables: A clarification of conceptual, analytic, and psychometric issues. *Organizational Behavior and Human Performance*, 29: 143-174.
- [86] Covin, J. G., Green, K. M., and Slevin, D. P. 2006. Strategic process effects on the entrepreneurial orientation-sales growth rate relationship. *Entrepreneurship Theory & Practice*, 30(1): 57-81.
- [87] Greene, W. 2004. *Econometric Analysis*, 5th ed. New York, Prentice Hall.
- [88] Clogg, C.C., Petkova, E., and Haritou, A. 1995. Statistical methods for comparing regression coefficients between models. *American Journal of Sociology*, 100: 1261-1293.
- [89] Kowtha, N.R. 2008. Engineering the engineers. Socialization tactics and new engineer adjustment in organizations. *IEEE Transactions on Engineering Management*, 55 (1): 67-81.
- [90] Prajogo, D.I. and Ahmed, P.K. 2006. Relationships between innovation stimulus, innovation capacity, and innovation performance. *R&D Management*, 36 (5): 499-515.
- [91] Song, X.M. and Dyer, B. 1995. Innovation strategy and the R&D-marketing interface in Japanese firms: A contingency perspective. *IEEE Transactions on Engineering Management*, 42 (4): 360-371
- [92] Ancona, D. and Caldwell, D. 2004. Making teamwork work: Boundary management in product development teams. In *Managing Strategic Innovation and Change, A Collection of Readings*, 2nd ed., M.L. Tushman and P. Anderson, Eds., New York: Oxford University Press, 432-440.
- [93] Covin, J.G., Green, K.M., and Slevin, D.P. 2006. Strategic process effects on the entrepreneurial orientation-sales growth rate relationship. *Entrepreneurship Theory and Practice*, 30 (1): 57-81.
- [94] Grover, V., Purvis, R.L., and Segars, A.H. 2007. Exploring ambidextrous innovation tendencies in the adoption of telecommunications technologies. *IEEE Transactions on Engineering Management*, 54 (2): 268-285.

- [95] Wu, H.-L., Lin, B.-W., and Chen, C.J. 2007. Contingency view on technological differentiation and firm performance: evidence in an economic downturn. *R&D Management*, 37 (1): 75-88.
- [96] Adler, P.S., Goldoftas, B., and Levine, D.I. 1999. Flexibility versus efficiency? A case study of model changeovers in the Toyota Production System. *Organization Science*, 10 (1): 43-68.
- [97] Bolino, M.C., Turnley, W.H., and Bloodgood, J.M. 2002. Citizenship behavior and the creation of social capital in organizations. *Academy of Management Review*, 27: 505-522.
- [98] Hofstede, G. 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations*, 2d ed. Thousand Oaks, CA, Sage.
- [99] Lewicki, R. and Bunker, B. 1996. Developing and maintaining trust in work relationships. In *Trust in Organizations: Frontiers of Theory and Research*, Tom Tyler and Roderick Kramer, Eds., Thousand Oaks, CA, Sage, 114-139.

Table I: Constructs and measurement items^a

| | Factor Loading | t-Value |
|---|-----------------------|----------------|
| Firm performance ($\alpha = 0.92$; CR = 0.92; AVE = 0.53) | | |
| Return on investment | 0.776 | 16.332 |
| Return on sales | 0.854 ^a | |
| Profit growth | 0.837 | 15.449 |
| Return on assets | 0.828 | 15.335 |
| Overall efficiency of operations | 0.667 | 9.973 |
| Sales growth | 0.635 | 10.661 |
| Market share growth | 0.612 | 9.602 |
| Cash flow from operations | 0.778 | 13.824 |
| Firm's overall reputation | 0.657 | 9.932 |
| Innovation ($\alpha = 0.85$; CR = 0.83; AVE = 0.46) | | |
| Our company accepts demands that go beyond existing products and services. | 0.532 | 7.47 |
| We focus on inventing new products and services. | 0.727 | 9.968 |
| We experiment with new products and services in our local market. | 0.729 ^a | |
| We commercialize products and services that are completely new to our company. | 0.806 | 10.966 |
| We frequently utilize new opportunities in new markets. | 0.782 | 10.396 |
| Our company regularly uses new distribution channels. | 0.406 | 5.506 |
| We regularly search for and approach new clients in new markets. | 0.511 | 7.064 |
| Decision autonomy ($\alpha = 0.90$; CR = 0.90; AVE = 0.69) (reverse coded) | | |
| Any decision our department makes needs to be approved by top management. | 0.697 ^a | |
| Even small matters have to be referred to someone higher up for a final answer. | 0.882 | 12.458 |
| Individual departments need to get permission from top management almost every time they want to do anything. | 0.919 | 12.694 |
| Individual departments are strongly discouraged from making their own decisions. | 0.813 | 11.512 |
| Trust ($\alpha = 0.87$; CR = 0.90; AVE = 0.64) | | |
| People from the other function can always be trusted to do what is right for us. | 0.812 | 12.259 |
| People from the other function always keep the promises they make to us. | 0.726 | 13.363 |
| People from the other function are perfectly honest and truthful with us. | 0.919 ^a | |
| People from the other function are truly sincere in their promises. | 0.837 | 16.422 |
| People from the other function would not take advantage of us, even if the opportunity arose. | 0.696 | 12.713 |
| Organizational commitment ($\alpha = 0.91$; CR = 0.91; AVE = 0.73) | | |
| People feel like "part of the family" in the company. | 0.908 ^a | |
| People feel a strong sense of belonging to the company. | 0.955 | 24.456 |
| Generally, people would be happy to spend the rest of their career with the company. | 0.798 | 16.475 |
| People feel as if this company's problems are their own. | 0.731 | 13.958 |

^a Initial loading was fixed to 1 to set the scale of the construct.; CR = construct reliability; AVE = average variance extracted.

Table II: Descriptive statistics and correlations (N = 232)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|------------------------------|--------|---------|--------|--------|-------|--------|--------|---------|---------|-------|-------|-------|--------|-------|-------|-------|
| 1. Firm performance | | | | | | | | | | | | | | | | |
| 2. Innovation | .260** | | | | | | | | | | | | | | | |
| 3. Decision autonomy | .277** | .180** | | | | | | | | | | | | | | |
| 4. Trust | .290** | .218** | .340** | | | | | | | | | | | | | |
| 5. Organizational commitment | .503** | .281** | .475** | .511** | | | | | | | | | | | | |
| 6. Company size | .131* | -.062 | .117 | .046 | .096 | | | | | | | | | | | |
| 7. Company age | -.023 | -.171** | .053 | .059 | .085 | .522** | | | | | | | | | | |
| 8. Industry: manufacturing | .036 | .014 | -.098 | .092 | .020 | .108 | .091 | | | | | | | | | |
| 9. Industry: services | -.063 | .039 | .090 | -.078 | -.031 | -.155* | -.132* | -.580** | | | | | | | | |
| 1. Industry: mining | -.034 | -.058 | .094 | -.063 | .019 | -.064 | -.100 | -.307** | -.198** | | | | | | | |
| 11. Industry: construction | .177** | .101 | .031 | .121 | .158* | .037 | .046 | -.126 | -.081 | -.043 | | | | | | |
| 12. Industry: transportation | .017 | -.066 | -.023 | .011 | -.024 | .097 | .014 | -.231** | -.149* | -.079 | -.032 | | | | | |
| 13. Industry: wholesale | .043 | .063 | .043 | .062 | -.027 | -.069 | -.084 | -.191** | -.123 | -.065 | -.027 | -.049 | | | | |
| 14. Industry: retail | -.024 | .004 | -.069 | -.051 | -.020 | .084 | .345** | -.155* | -.099 | -.053 | -.022 | -.040 | -.033 | | | |
| 15. Commercial function | .150* | -.065 | -.047 | .066 | .026 | .156* | .193** | .043 | -.063 | -.085 | .067 | -.017 | .069 | .001 | | |
| 16. Mixed function | .033 | .051 | -.020 | .054 | .161* | .001 | .039 | -.046 | -.049 | .058 | .077 | -.008 | .177** | -.050 | -.089 | |
| Mean | 3.519 | 3.434 | 3.722 | 3.380 | 3.571 | 5.647 | 32.871 | 0.474 | 0.272 | 0.095 | 0.017 | 0.056 | 0.039 | 0.026 | 0.496 | 0.086 |
| Standard deviation | 0.756 | 0.793 | 0.920 | 0.790 | 0.938 | 1.991 | 36.305 | 0.500 | 0.446 | 0.294 | 0.130 | 0.230 | 0.194 | 0.159 | 0.501 | 0.281 |
| Minimum | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.10 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Maximum | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 11.31 | 116.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

** $p < .01$; * $p < .05$

Table III: Ordinary least squares estimation of firm performance (N = 232)

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|---|--------------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------|
| Company size (log employees) | 0.072** | 0.066* | 0.054* | 0.051* | 0.059* | 0.059* | 0.056* | 0.059* |
| Company age (years) | -0.004* | -0.003 | -0.004* | -0.003* | -0.003* | -0.004* | -0.003* | -0.003* |
| Industry: manufacturing ^a | 0.564 ⁺ | 0.400 | 0.346 | 0.481 ⁺ | 0.437 | 0.469 | 0.512 ⁺ | 0.431 |
| Industry: services | 0.486 | 0.322 | 0.264 | 0.364 | 0.354 | 0.356 | 0.394 | 0.331 |
| Industry: mining | 0.476 | 0.364 | 0.247 | 0.363 | 0.329 | 0.359 | 0.394 | 0.338 |
| Industry: construction | 1.487** | 1.183* | 0.852* | 0.959* | 0.820 ⁺ | 0.893* | 0.927* | 0.933* |
| Industry: transportation | 0.556 | 0.449 | 0.409 | 0.505 | 0.475 | 0.473 | 0.517 | 0.422 |
| Industry: wholesale | 0.635 | 0.440 | 0.470 | 0.611 ⁺ | 0.546 | 0.624 ⁺ | 0.649 ⁺ | 0.434 |
| Industry: retail | 0.649 | 0.399 | 0.479 | 0.600 | 0.517 | 0.551 | 0.598 | 0.539 |
| Commercial function ^b | 0.226* | 0.237* | 0.222* | 0.221* | 0.238** | 0.214* | 0.223* | 0.237** |
| Mixed function (technical and commercial) | 0.090 | 0.061 | -0.096 | -0.085 | -0.082 | -0.101 | -0.087 | 0.011 |
| Innovation | | 0.226*** | 0.096 ⁺ | 0.068 | 0.107 ⁺ | 0.082 | 0.076 | 0.117* |
| Decision autonomy | | | 0.041 | 0.049 | 0.050 | 0.046 | 0.051 | |
| Trust | | | -0.002 | 0.004 | -0.013 | -0.012 | -0.006 | |
| Organizational commitment | | | 0.353*** | 0.360*** | 0.349*** | 0.365*** | 0.361*** | |
| H1: Innovation × Decision autonomy | | | | 0.146** | | | 0.091 | |
| H2: Innovation × Trust | | | | | 0.138* | | 0.043 ⁺ | |
| H3: Innovation × Organizational commitment | | | | | | 0.132** | 0.058 | |
| Similarity to "ideal" configuration | | | | | | | | 0.249*** |
| H4: Innovation × Similarity to ideal configuration | | | | | | | | 0.104** |
| R-square | 0.094 | 0.146 | 0.329 | 0.353 | 0.344 | 0.350 | 0.357 | 0.298 |
| ΔR-square | | 0.052*** | 0.183*** | 0.024** | 0.015* | 0.021** | 0.028* | 0.152*** |

Notes: Unstandardized coefficients (two-tailed p -values); *** $p < .001$; ** $p < .01$; * $p < .05$; ⁺ $p < .10$.

^a Base case = finance industry; ^b Base case = technical function.

Table IV: Ordinary least squares estimation of firms' revenue growth and income growth

| | Revenue growth (N=107) | | | | Income growth (N=70) | | | |
|---|------------------------|---------------|---------------|---------------------|----------------------|---------------|--------------------|---------------|
| | Model 4 | Model 5 | Model 6 | Model 8 | Model 4 | Model 5 | Model 6 | Model 8 |
| Company size (log employees) | -0.071 | -0.051 | -0.070 | -0.044 | 0.098 | 0.120* | 0.115 ⁺ | 0.117* |
| Company age (years) | -0.003 | -0.003 | -0.006 | -0.003 | 0.010 | 0.006 | 0.004 | 0.003 |
| Industry: manufacturing ^a | 0.604 | 0.450 | 0.482 | 0.425 | -0.408 | 0.218 | 0.197 | 0.013 |
| Industry: services | 0.031 | -0.091 | -0.159 | -0.018 | -0.130 | 0.676 | 0.697 | 0.404 |
| Industry: mining | 0.629 | 0.478 | 0.340 | 0.491 | -0.729 | -0.112 | -0.217 | -0.506 |
| Industry: transportation | 0.657 | 0.575 | 0.553 | 0.583 | -0.686 | -0.276 | -0.231 | -0.486 |
| Industry: wholesale | 0.447 | 0.340 | 0.337 | 0.323 | -0.715 | -0.178 | -0.199 | -0.382 |
| Industry: retail | -0.019 | -0.250 | -0.310 | -0.168 | -0.781 | 0.002 | 0.428 | 0.159 |
| Commercially function ^b | -0.308 | -0.340 | -0.342 | -0.401 ⁺ | -0.268 | -0.144 | -0.083 | -0.064 |
| Mixed function (technical and commercial) | -0.165 | -0.183 | -0.248 | -0.180 | -0.172 | 0.095 | 0.277 | 0.151 |
| Innovation | -0.012 | 0.019 | -0.121 | -0.020 | 0.125 | -0.135 | -0.008 | -0.001 |
| Decision autonomy | 0.023 | 0.025 | -0.028 | | -0.204 | -0.033 | -0.039 | |
| Trust | -0.197 | -0.157 | -0.195 | | 0.072 | -0.001 | 0.061 | |
| Organizational commitment | 0.147 | 0.074 | 0.121 | | -0.035 | -0.030 | -0.085 | |
| H1: Innovation × Decision autonomy | 0.233** | | | | 0.304* | | | |
| H2: Innovation × Trust | | 0.201* | | | | 0.293* | | |
| H3: Innovation × Organizational commitment | | | 0.379* | | | | 0.325* | |
| Similarity to "ideal" configuration | | | | -0.016 | | | | -0.066 |
| H4: Innovation × Similarity to ideal configuration | | | | 0.162* | | | | 0.383* |
| R-square | 0.195 | 0.172 | 0.192 | 0.143 | 0.343 | 0.402 | 0.403 | 0.384 |
| ΔR-square | 0.069** | 0.046* | 0.066** | 0.036* | 0.070* | 0.129** | 0.130** | 0.111** |

Notes: Unstandardized coefficients (two-tailed *p*-values); ****p* < .001; ***p* < .01; **p* < .05; ⁺ *p* < .10.

^a Base case = finance industry; ^b Base case = technically oriented function

Figure 1: Conceptual model of the moderating effects of decision autonomy, trust, and organizational commitment on the innovation–firm performance relationship

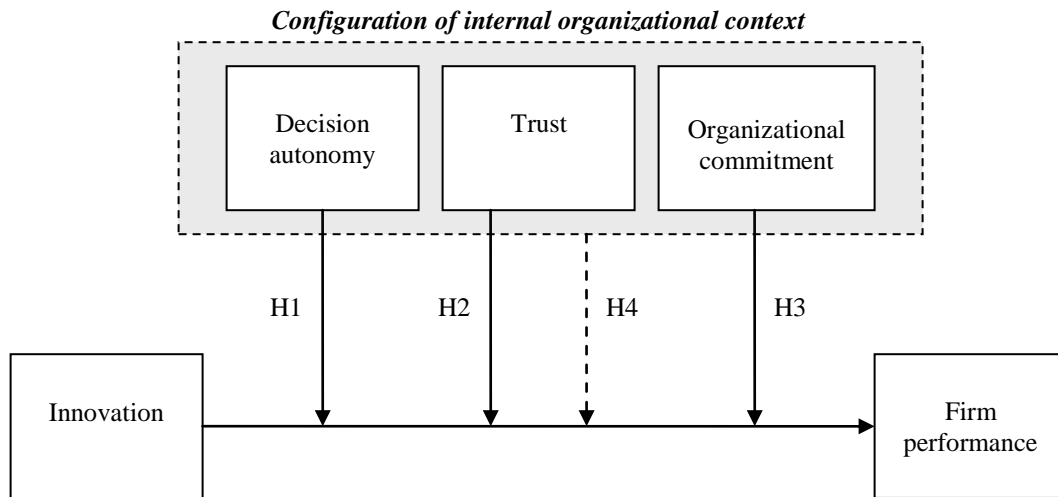


Figure 2 (Panel A): Moderating Effect of Decision Autonomy on the Innovation–Firm Performance Relationship

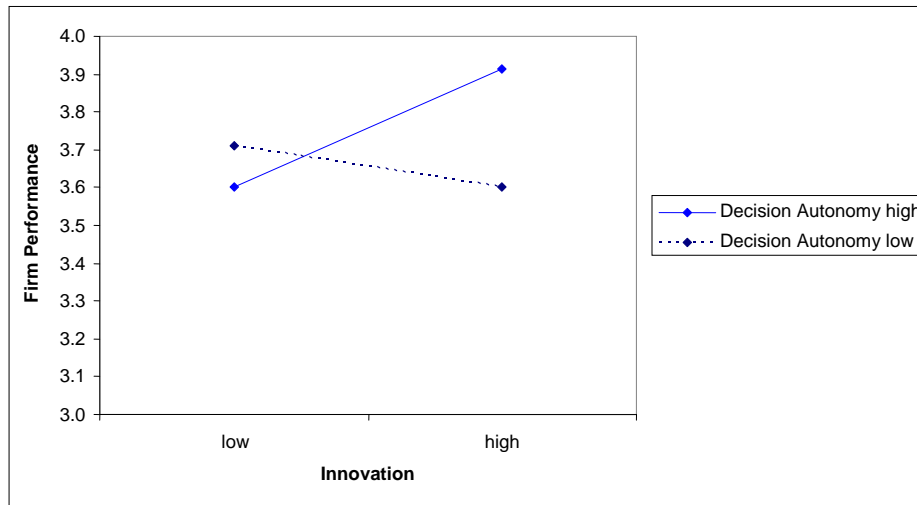


Figure 2 (Panel C): Moderating Effect of Organizational Commitment on the Innovation–Firm Performance Relationship

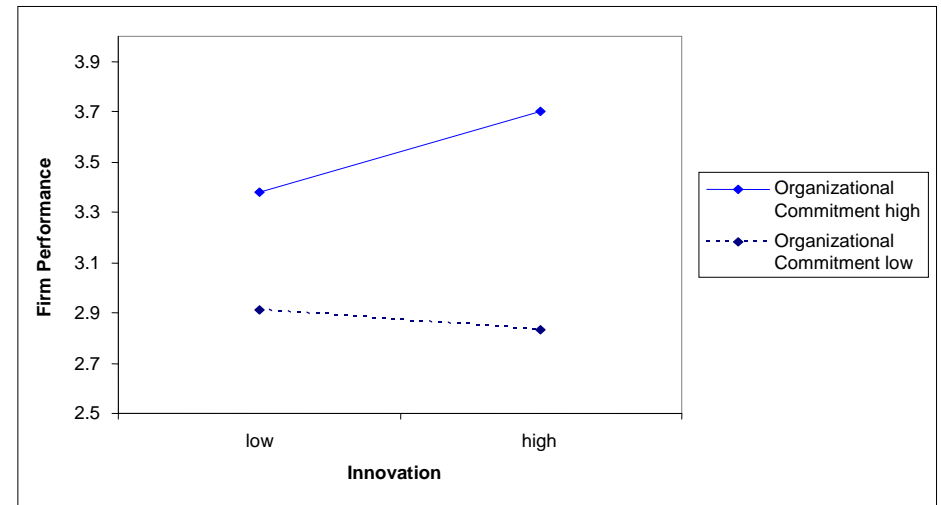


Figure 2 (Panel B): Moderating Effect of Trust on the Innovation–Firm Performance Relationship

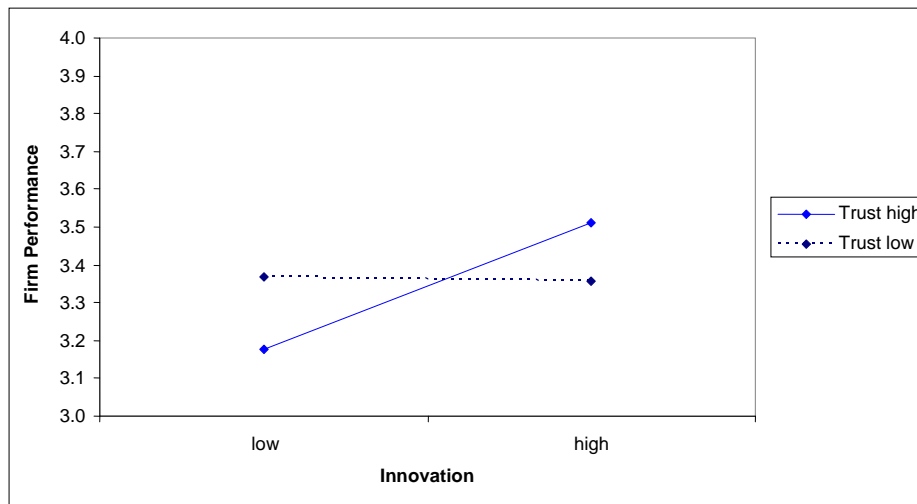


Figure 2 (Panel D): Moderating Effect of Similarity to Ideal Configuration of Decision Autonomy, Trust, and Organizational Commitment on the Innovation–Firm Performance Relationship

